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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,258	08/19/2003	Thomas W. Holcomb	3382-65017	5843

26119 7590 04/17/2007
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EXAMINER

SENGI, BEHROOZ M

ART UNIT PAPER NUMBER

2621

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/17/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/644,258

Applicant(s)

HOLCOMB ET AL.

Examiner

Behrooz Senfi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-61 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 6) <input type="checkbox"/> Other: _____ |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :8/19/03,12/20/04,10/20/05,1/11/07.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 25 - 34 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Regarding claim 25, it is noted that, the claim invention "in a video encoder, a computer implemented method for signaling spatial resolutions in an encoded video sequence, the method comprising: including a first code in a bit-stream, wherein the first code indicates a first spatial resolution for a first frame encoded at the first spatial resolution; and including a second code in the bit-stream, wherein the second code indicates a second spatial resolution for a second frame encoded at the second spatial resolution; wherein the second spatial resolution differs from the first spatial resolution, and wherein the encoder chooses the second spatial resolution from a set of plural spatial resolutions to reduce blocking artifacts in the sequence of video frames" does not result to a practical application, which operate to produce a "useful, concrete and tangible result", as required in the Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility (Official Gazette Notice of 22 November 2005).

Claims 31 and 32 are non-statutory for the same reason as set forth in claim 25.

Claims 26 – 30 and 33 – 34 are dependent to independent claims 25 and 32, therefore the combination claims as a whole consider non-statutory.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

4. Claims 1 – 7, 12, 14 – 17, 19 – 21, 23, 25 – 33, 35 – 44, 46, 48 – 49 and 51 are rejected under 35 U.S.C. 102(b) as being anticipated by Yuan et al. (US 5,821,986).

Regarding claims 1 and 20, Yuan '986 discloses, in a video encoder, a computer implemented method for encoding video at any of multiple spatial resolutions (i.e. fig. 1, codec 12, col. 5, lines 45 – 47) comprising: encoding at least one frame in a sequence of plural video frames at a first spatial resolution (col. 5, 45 – 60, and col. 6, table in the top of the page) and encoding at least one other frame in the sequence of plural video frames at a second spatial resolution (col. 5 – 6, lines 45 – 13, and fig. 4, wherein each dot represents an image frame in the sequence of images), and wherein the second spatial resolution differs from the first spatial resolution (col. 6, table in the top of the page shows the resolutions are different, also the video encoder performs encoding at several spatial resolutions) and wherein the encoder chooses the second spatial resolution from a set of plural spatial resolutions to reduce blocking artifacts in the sequence of video frames (col. 6, 32 – 42, col. 7, lines 10 – 15 and col. 19, lines 37 – 38).

Regarding claim 2, Yuan '986 discloses, wherein the second spatial resolution comprises a vertical resolution with a vertical scaling factor and a horizontal resolution

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with a horizontal scaling factor, and wherein the vertical scaling factor differs from the horizontal scaling factor (i.e. col. 6, top of the page, wherein the vertical and horizontal resolutions have different factor).

Regarding claims 3 – 5, Yuan '986 discloses, (in claim 4) bit-rate criteria (col. 3, lines 57 – col. 4, lines 2, col. 12, lines 33 – 36), and (in claims 5 - 6) high-frequency content and quantization (i.e. fig. 7, element 162 and 168).

Regarding claims 6 - 7, Yuan '986 discloses, down-sampling filter (col. 7, lines 22 – 24).

Regarding claim 12, Yuan '986 discloses, up-sampling filter (i.e. fig. 3, up-sample filter 82).

Regarding claims 14 – 15, the limitations, encoding at least one other frame at a second spatial resolution is indicated by a signal code (Col. 6, top of the page, where the encoder indicates the resolution of the other frame, second spatial resolution) and flag in the header for the sequence of plural video frames to indicate that the plural frames are encoded using more than one spatial resolution, reads on (layers header, col. 14, lines 37 – 40).

Regarding claims 16 - 17, Yuan '986 discloses, wherein the first and second resolutions are selected from a group comprising more than two spatial resolutions (page 6, lines 1 – 10).

Regarding claim 19, the limitations claimed are computer-implemented program to perform method of claim 1 above. Since the disclosure of Yuan as described can be

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implemented in either hardware, software, or a combination (i.e. col. 5, lines 15 – 20), therefore the grounds for rejecting claim 1 also applies here.

Regarding claim 21, Yuan '986 discloses, frame comprises high-frequency content, and wherein the first spatial resolution is a full resolution (col. 17, lines 30 – 36).

Regarding claim 23, the limitations, signaling the first spatial resolution with a first code in a bit-stream and signaling the second spatial resolution with a second code (col. 6, top of the page, where the encoder indicates the resolution of the other frame, second spatial resolution).

Regarding claim 25, the limitations claimed have been analyzed and rejected with respect to claim 1 above.

Regarding claim 26, the limitations claimed have been analyzed and rejected with respect to claim 2 above.

Regarding claims 27 - 28, Yuan '986 discloses, fixed length code (col. 12, lines 20 – 22) and variable length code (col. 12, lines 20 – 22).

Regarding claim 29, Yuan '986 discloses, sequence code indicates whether multi-resolution encoding is used in the encoded video sequence (col. 14, lines 39 – 40, where the bit-stream-header specifies the multi-resolution of layers).

Regarding claims 30 and 33, Yuan '986 discloses, including a filter code in the bit-stream, wherein the filter code indicates a re-sampling filter to be used for decoding (i.e. fig. 19, and col. 6, lines 1 – 40, wherein with respect to each layer information a re-sampling filter would be used in decoding side for that particular layer).

Regarding claim 31, the limitations claimed are computer-implemented program to perform method of claim 1 above. Since the disclosure of Yuan as described can be implemented in hardware, software, or a combination (i.e. col. 5, lines 15 – 20).

Regarding claim 32, the limitations claimed are substantially similar to claim 1; therefore the ground for rejecting claim 1 also applies here.

Regarding claim 35, the limitations claimed are substantially similar to claim 1; therefore the ground for rejecting claim 1 also applies here. As for setting more than one spatial resolution for encoding plural video frames, reads on (setting the scaling factor for encoding purpose to have multi-resolution/quality video).

Regarding claim 36, the limitations claimed are decoding method of multi-resolution video encoding of claim 1, which reads on Yuan (i.e. fig. 19 video decoding process).

Regarding claim 37, Yuan '986 discloses, wherein the second spatial resolution differs from the first spatial resolution by a factor of 2 (i.e. col. 6, top of the page, wherein the resolution of layer 2 differs from the first resolution by a factor of 2).

Regarding claims 38 - 43, the limitations, wherein the second spatial resolution comprises a vertical resolution with a vertical scaling factor and a horizontal resolution with a horizontal scaling factor, and wherein the vertical scaling factor differs from the horizontal scaling factor (i.e. col. 6, top of the page, wherein the vertical and horizontal resolutions have different factor), and bit-rate criteria (col. 3, lines 57 – col. 4, lines 2, col. 12, lines 33 – 36), and high-frequency content and quantization (i.e. fig. 7, element 162 and 168) and down-sampling filter (col. 7, lines 22 – 24).

Regarding claim 44, Yuan '986 discloses, up-sampling the decoded frame, wherein the up sampling yields a full resolution decoded frame (i.e. fig. 19).

Regarding claim 46, the limitations, signaling the first spatial resolution with a first code in a bit-stream and signaling the second spatial resolution with a second code (col. 6, top of the page, where the encoder indicates the resolution of the other frame, second spatial resolution).

Regarding claim 48, the disclosure of Yuan as described can be implemented in hardware, software, or a combination (i.e. col. 5, lines 15 – 20).

Regarding claims 49 and 51, the limitations claimed are decoding method of multi-resolution video encoding of claim 1, which reads on Yuan (i.e. fig. 19 video decoding process).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 8 – 11, 13, 22, 45, 52 – 553, 55, 56 – 58 and 60 - 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yuan et al. (US 5,821,986) in view of Gryskiewicz (US 6,937,291).

Regarding claims 8, 9, 22 and 52, Yuan '986 teaches, filter for down-conversion of the image resolution (i.e. col. 7, lines 22 – 24).

Yuan '986 is silent in regards to explicit of down-sampling filter, is a 6-tap filter.

Gryskiewicz in the same field teaches (fig. 3, filter 70, abstract, lines 1 – 2, col. 3, lines 55 – 60 and col. 4, lines 32 – 35) adaptive filter is adjustable for performing down-sampling/scaling, by using an N-tap filter, wherein the number of taps is based on the desired output/application, which would cover the limitations as claimed.

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to use a 6-tap filter in accordance with the teaching of Gryskiewicz for down-sampling of the image resolution as desired.

Regarding claims 10 and 53, Gryskiewicz teaches, resolution is down-sampled in horizontal direction prior to being down-sampled in a vertical direction (i.e. fig. 1, horizontal scaling takes place prior to vertical scaling).

Regarding claim 11, the limitations, calculating new dimensions for the frame at the second (another) spatial resolution, reads on down-scaling of the image resolution to another and/or a new image resolution as taught by Yuan and also Gryskiewicz.

Regarding claims 55 and 60, the scaling operation as taught by Yuan and Gryskiewicz is performed for each video image in a video sequence.

Regarding claims 56 and 61, Gryskiewicz teaches, computer readable medium storing computer instructions for causing the computer system to perform the method of claim 52 (i.e. fig. 1).

Regarding claims 13, 45 and 57, Yuan is silent in regards to explicit of ten tap up-sampling filter.

Gryskiewicz in the same field teaches (fig. 3, filter range from 2-tap to 80 taps to produce a high quality output signal, col. 4, lines 42 – 55).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify Yuan's video compression in accordance with the teaching of Gryskiewicz by using an adaptive N-tap filter to determine and produce a high quality output signal.

Regarding claim 58, Gryskiewicz teaches, horizontal and vertical re-sampling, wherein the horizontal re-sampling is performed prior to the vertical re-sampling (i.e. fig. 1, horizontal scaling takes place prior to vertical scaling).

7. Claims 18, 24, 34, 47 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yuan et al. (US 5,821,986) in view of Gonzales et al (US 5,414,469).

Regarding claims 18, 24, 34, 47 and 50; Yuan is silent in regards to explicit of frame comprises bi-directionally predicted frame (B-frame).

Gonzales in the same field of video compression teaches the above subject matter, bi-directionally predicted frame (B-frame) (i.e. fig. 5, B-frames).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify video compression of Yuan in accordance with the teaching of Gonzales to provide a encoding/decoding architecture for compressing video sequences, which permit the decoding of video at a multiplicity of spatial resolution and bit-stream scales, as suggested by Gonzales (col. 7, lines 48 – 50).

8. Claims 54 and 59 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yuan et al. (US 5,821,986) in view of Gryskiewicz (US 6,937,291) further in view of Gonzales et al (US 5,414,469).

Regarding claims 54 and 59, Yuan is silent in regards to explicit of, rounding a number of chrominance samples to a multiple of 8 and luminance to a multiple of 16.

Gonzales in the same field of video compression teaches the above subject matter, rounding a number of chrominance samples to a multiple of 8 and luminance to a multiple of 16 (i.e. fig. 6).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify video compression of Yuan in accordance with the teaching of Gonzales to provide a encoding/decoding architecture for compressing video sequences, which permit the decoding of video at a multiplicity of spatial resolution and bit-stream scales, as suggested by Gonzales (col. 7, lines 48 – 50).

Contact

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Behrooz Senfi** whose telephone number is **(571) 272-7339**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Mehrdad Dastouri** can be reached on **(571) 272-7418**.

Hand-delivered responses should be brought to Randolph Building, 401 Dulany Street, Alexandria, Va. 22314.

Any inquiry of a general nature or relative to the status of the application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is **(571) 272-6000**,

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Or faxed to:

(571) 273-8300

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

B.M.S.



TUNG VO
PRIMARY EXAMINER